

Report on Review of Core Content Program Alignment to the Arizona Science Standard (K-6)

***AZ Academic Standards Unit
Standards and Assessment Division
Arizona Department of Education***

June 2007

The Arizona Department of Education AZ Academic Standards office would like to extend our thanks and appreciation to the Review of Core Content Programs for Mathematics, Science, and Social Studies Standards Alignment Panel members for their commitment of time and conscientious work in providing this guidance to schools. We also extend thanks to the publishers of content materials and their sales representatives who participated in this project. Through shared accountability and the cooperative efforts of many, we will reach our common goal of implementation of the Arizona Academic Standards.

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Introduction

The Arizona Department of Education (ADE) is committed to support and assist schools in implementing the Arizona Academic Standards so that all Arizona's students have the opportunity to learn them. With that goal in mind, and to be responsive to the field, the ADE conducted a series of analyses of the alignment of reading, mathematics, science, and social studies programs to the Arizona Standards. The Arizona Department of Education AZ Academic Standards Unit is providing this information as a service to Arizona districts and schools to assist them in making informed choices regarding the selection and use of instructional materials. This report includes the review of core content program alignment with the Arizona Science Standard (K-6).

How Arizona Districts Might Use This Information ...

- To identify those core content programs in science that they would analyze in greater depth to determine which is the best match for their student and teacher needs;
- To support their selection of a core content program in science;
- To assist in curriculum development, curriculum mapping, and the alignment process.

How Arizona Schools and Teachers Might Use This Information ...

- To identify areas that may need augmentation in core content programs in science;
- To support their selection of a core content program in science;
- To assist in curriculum development, curriculum mapping, and the alignment process.

Purpose of the Review of Core Science Program Alignment to the Arizona Science Standard

The Arizona Department of Education AZ Academic Standards Unit is providing summary information as a service to Arizona districts and schools to assist them in making informed choices regarding the selection and use of core content programs that are aligned to the Arizona Articulated Science Standard.

The Arizona Review of Core Content Programs for Science Standard Alignment had four objectives:

- 1) Analyze the core program and determine the degree to which the content of the lesson(s) aligns with the Grade Level Expectation.
- 2) Analyze the core program and determine the degree to which the cognitive demand of the lesson(s) aligns with the Grade Level Expectation.
- 3) Analyze the core program and examine the context of the lesson(s) to determine the type and number of opportunities that are available for students to apply their understanding of the Grade Level Expectation.
- 4) Analyze the core program and determine the degree to which the content of the lesson(s) is accurately represented and consistent with current scientific knowledge; vocabulary and explanations about the content are grade-appropriate, without distorting or losing original meaning.

This report is released with the following clarifications:

What It is *Not*...

- **It in no way constitutes an approved or recommended textbook/program adoption list for Arizona schools or an endorsement of any program;**
- **It is not an all-inclusive list; it includes only those publishers who chose to submit materials for review upon invitation;**
- **It is an important, but not the only factor that districts and schools need to consider when selecting core content materials.**

What It Is...

- **An analysis of a core science program's alignment to the Arizona Articulated Science Standard based on content, cognitive demand, context, and accuracy.**

Selection of Panel Members for Review of Core Program Alignment to the Science Standard

The Arizona Department of Education issued a call to educators across the state to serve on the Core Content Program Review Panel for Science Standard Alignment. Panel members were selected based on their knowledge of and experience implementing the Arizona Articulated Science Standard. The Panel represented both urban and rural districts from various geographic regions in Arizona. The Panel reviewed and analyzed all submitted materials. The Arizona Department of Education AZ Academic Standards staff members provided the training, facilitated the work of the Panel, and assisted Panel members, but did not participate in the analysis of the materials submitted.

Process of the Review of Core Content Program Alignment to the Science Standard

Announcements were posted on the ADE website inviting publishers to submit for review their core K-3 and 4-8 science programs including teacher guides, student texts, alignment documents, and ancillary/support pieces that were considered components of a standard adoption. Publishers were informed of the purpose of this review and that only core content programs would be reviewed.

A core K-8 science program:

- is the principle instructional tool that teachers use to teach children science in order to achieve at or above grade level;
- meets the instructional needs of all children within the classroom through differentiation of instruction;
- is guided by ongoing assessment;
- addresses all strands of the Science Standard systematically and coherently; and
- can be enriched by other materials and strategies to provide a comprehensive, coordinated program of instruction.

Publishers were informed that this review was voluntary and was not for the purpose of establishing an adopted or approved list of core content programs for the state of Arizona.

Panel committee members were provided with one half-day of training and practice using the ADE rubric. Members were organized into teams of two to four people. All materials were reviewed in pairs. All differences of opinion were resolved in consensus discussions. Alignment scores were recorded after consensus was reached.

Teachers' guides, representative student materials, and ancillary/support materials that were received as part of a standard adoption were thoroughly examined to determine the degree of alignment to our State Standards based on four elements: content, cognitive demand, context, and accuracy. Each of these four elements were scored using the following assignments: *Exceeds the Standard (4)*, *Meets the Standard (3)*, *Approaches the Standard (2)*, *Falls Far Below the Standard (1)* or *Not Observed (0)*.

After all the results were compiled and summarized, publishers were given the opportunity to review and discuss results with ADE staff prior to publication.

Program Reviews – Reading the Tables

Table - Alignment Summary for the Arizona Science Standard

Example of Table for Science: Grade 4

Publisher: GHIJ				
	Content (4 pts max per PO)	Cognitive Demand (4 pts max per PO)	Context (4 pts max per PO)	Accuracy (4 pts max per PO)
Strand 4: Life Science				
Strand 4, Concept 1: Characteristics of Organisms				
PO1	3	3	2	3
PO2	3	1	3	3
Strand 4, Concept 2: Reproduction and Heredity				
No POs at this grade level				
Strand 4, Concept 3: Organisms and Environments				
PO1	4	3	2	3
PO2	4	4	2	2
PO3	0	N/A	N/A	N/A
PO4	3	3	1	2
Strand 4, Concept 4: Diversity, Adaptation, and Behavior				
PO1	4	3	3	1
PO2	1	2	2	3

**KEY: 4 (Exceeds the Standard) 3(Meets the Standard) 2(Approaches the Standard)
1 (Falls Far Below the Standard) 0(Not Observed)**

As shown in the example of the table above, the review of **Publisher Program GHIJ** for alignment to Strand 4-Concept 1-Performance Objective 1, resulted in the following ratings: **3** (meets the standard) for content, **3** (meets the standard) for cognitive demand, **2** (approaches the standard) for context, and **3** (meets the standard) for accuracy. See rubric for specific descriptions for each rating (page 8).

As shown in the table, the review of **Publisher Program GHIJ** for alignment to Strand 4-Concept 3-Performance Objective 3, resulted in the rating of **0** (not observed) for content. Since the program received a 0 for content, the remaining elements of cognitive demand, context, and accuracy were recorded as **Not Applicable (N/A)**.

Special Considerations of the Science Alignment Review

The following factors were addressed by the review committees and need to be considered when using the alignment review.

1. The content focus of Strands 1-3 must be linked to the grade level content of Strands 4-6. Page x of the introduction of the Arizona Science Standard explains the design of the standard – “Strands 1, 2, and 3 are designed to be explicitly taught *and* embedded *within* each of the content strands 4, 5, and 6, and are not intended to be taught in isolation. The processes, skills, and content of the first three strands are designed to “umbrella” and complement the content of Life Science, Physical Science, and Earth and Space Science. “

While the text may have included multiple opportunities for students to analyze data, learn about important contributions to science, or evaluate the impact of science on society, only the opportunities that were linked to the grade level content in Strands 4-6 were evaluated. For example, if astronauts were described as science

career opportunities, but space science was not taught at that grade level, the passage was not considered to be aligned to the Strand 2 objective.

2. Textbooks often cover additional content not included in our standard. The committee only reviewed the sections of the books that corresponded to concepts in each grade level standard, even if the text covered more content. Therefore, additional content or inquiry skills may be taught in a portion of the book not reviewed by the committee.

3. All bullets and i.e. items must be included for full alignment (Content score of 3). If a bulleted or an i.e. item was missing from the content, the textbook could not receive a Content score higher than a 2 for that objective. E.g. items did not have to be included but other appropriate examples must be used in the content.

4. Alignment to our standard may be addressed in other, non-core components of the programs. Textbook companies often offer other supplemental materials in their programs which may address concepts and performance objectives missing in their core textbook. Since there is an additional cost for these materials, or they are accessed through online resources, the committee did not review them. The only materials reviewed were the core components of the program.

Alphabetical List of Reviewed Publishers

A total of 8 publishers submitted a core science program for review. These publishers are listed below in alphabetical order. Publishers did not receive a total score or ranking as a result of this analysis.

Carolina Biological Company. STC Program, 2004-2006 (Grades 4-5)

Delta Education. FOSS, (various dates) (Grades 4-6) – **Will be available September, 2007**

Harcourt School Publishers, Harcourt Science, Arizona Edition, 2006 (Grades K-6)

Houghton Mifflin Company, Science Arizona, 2007 (Grades K-6)

Kendall Hunt Publishing Company, Insights, 2003-2006 (Grades 4-6)

Kendall Hunt Publishing Company, BSCS TRACKS, 2006 (Grades 4-5)

MacMillan / McGraw Hill, Science - A Closer Look, 2008 (Grades K-6)

Newbridge Publishers, (various dates) (Grades K-3)

Scott Foresman and Pearson Education Inc, Science, 2006 (Grades K-6)

Scott Foresman and Pearson Education Inc, Science Companion 2005-2007 (Grades K-5) – **Will be available September, 2007**

A copy of the analysis results from one or more publishers is available on request from the Arizona Department of Education. Requests should be emailed to AcadStandards@azed.gov and include the name of the requesting individual and his/ her school or district and the publisher name(s) with specific program names that are being requested.

**Arizona Department of Education
K-8 Core Mathematics Program Review Rubric
Program Alignment to Articulated Mathematics Standard**

Degree of Alignment	Score	Content	Cognitive Demand	Context
Exceeds	4	The content of the lesson(s) exceeds the Grade Level Expectation.	The cognitive demand of the lesson(s) exceeds the Grade Level Expectation. (verb)	The context of the lesson(s) provides multiple opportunities for students to apply and demonstrate their understanding in multiple ways . In addition, the context of the lesson(s) provides opportunities for extending understanding.
Meets	3	The content of the lesson(s) matches the Grade Level Expectation.	The cognitive demand of the lesson(s) matches the Grade Level Expectation. (verb)	The context of the lesson(s) provides multiple opportunities for students to apply and demonstrate their understanding in multiple ways .
Approaches	2	The content of the lesson(s) matches the Grade Level Expectation to some degree but not completely .	The cognitive demand of the lesson(s) matches the Grade Level Expectation (verb) to some degree but not completely .	The context of the lesson(s) provides multiple opportunities for students to apply and demonstrate their understanding but the opportunities are similar in design.
Falls Far Below	1	The content of the lesson(s) does not match the Grade Level Expectation.	The cognitive demand of the lesson(s) does not match the Grade Level Expectation. (verb)	The context of the lesson(s) provides few/no opportunities for students to apply and demonstrate their understanding.
Not Observed	0	The content of the lesson(s) does not address the Grade Level Expectation.		